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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,201	01/25/2005	Gyo Muramatsu	MURAMATSU2	8346
1444 7590 01/16/2007 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303			EXAMINER PICKARD, ALISON K	
			ART UNIT	PAPER NUMBER
			3673	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/16/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/523,201	<b>Applicant(s)</b> MURAMATSU ET AL.	
	<b>Examiner</b> Alison K. Pickard	<b>Art Unit</b> 3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to: See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. Claims 1-4, 6, 7, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted Prior art (APA) (spec. pages 1-4, particularly page 4) in view of Japanese Patent 57-74334 (JP '334).

Applicant admits that it is known to coat a piston ring with a PI or PAI material to prevent aluminum adhesion. And, Applicant admits that a PI or PAI-silicon dioxide hybrid material provides improved mechanical strength and heat resistance while maintaining softness and extensibility. However, Applicant does not disclose the piston is coated with a resin comprising either PI-SiO<sub>2</sub> hybrid or PAI-SiO<sub>2</sub> hybrid and a solid lubricant. JP '334 teaches an improved coating comprising a resin comprising PI material and an additional lubricant, such as molybdenum disulfide or boron nitride. The additional lubricant is a friction modifier and thus improves the wear resistance. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the coating of the admitted prior art with an additional solid lubricant as taught by JP '334 to provide good wear resistance with or without lubrication.

Regarding claims 2, 4, 6, and 7, JP '334 does not appear to disclose the particle size. However, it is not considered inventive to discover the workable or optimum ranges by routine experimentation absent the showing of criticality for such ranges. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). And it is known to use a solid lubricant with a resin coating having the claimed particle size and percentages as evidenced by Hannig. Therefore, it would have been

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obvious for one of ordinary skill in the art at the time the invention was made to use particles of the required size and percentages.

2. Claims 1-4, 6, 7, and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onada in view of Applicant's APA.

Onada discloses a piston ring having resin binder coating comprising PAI and a solid lubricant dispersed therein. Onoda does not disclose the coating is a PAI hybrid material. Applicant teaches that PAI-silicon dioxide hybrid material is an improved material that offers improved mechanical strength and heat resistance while maintaining softness and extensibility. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the resin by using the improved PAI-SiO<sub>2</sub> hybrid material taught by Applicant's to improve the coating functions.

Regarding claims 2, 4, 6, and 7, Onoda does not appear to disclose the particle size. However, it is not considered inventive to discover the workable or optimum ranges by routine experimentation absent the showing of criticality for such ranges. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). And it is known to use a solid lubricant with a resin coating having the claimed particle size and percentages as evidenced by Hannig. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to use particles of the required size and percentages.

***Allowable Subject Matter***

3. Claims 5 and 8-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

4. Applicant's arguments filed 10-19-06 have been fully considered but they are not persuasive.

The examiner has modified the rejection in view of the definition for "hybrid" that Applicant has specified. The claims are now being interpreted in view of this specific definition. However, Applicant's specification and JP '670 disclose/teach this hybrid material as having improved characteristics. And, it is known to provide a solid lubricant to a PI/PAI based resin to reduce friction, see JP '334 and Onoda. The examiner is not using official notice for claims 2, 4, 6, and 7. Case law has been established that optimized ranges are obvious. Hannig has been cited as evidence that such sizes and percentages are known when using a solid lubricant in a PI-based coating. Onoda discloses a nitride layer. However, there does not appear to be any mention of the thickness and Applicant's specification provides criticality for the claimed ranges.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (10-7:30), with alternate Friday's off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tricia Engle can be reached on 571-272-6660. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Alison K. Pickard  
Primary Examiner  
Art Unit 3673

AP